SHOUT
SHARE
IT

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 633

OFFICE OF THE SECRETARY
Contribution from the Office of Farm Management
W. J. SPILLMAN, Chief

Washington, D. C. February 25, 1918

FACTORS OF SUCCESSFUL FARMING NEAR MONETT, MO.

By W. J. SPILLMAN, *Chief, Office of Farm Management.*

CONTENTS.

	Page.		Page.
The area in the survey was made	1	The proper status of the strawberry industry in southwest Missouri	10
The local agriculture	2	The speculative nature of fruit enterprises	10
Farms classified according to type of farming	4	Maintenance of soil fertility	12
Sources of receipts	5	Organization of some typical farms	14
Percentage of area in different crops	5	Organization of dairy farms	17
Kinds of fruit and their local importance	6	A well-organized two-man farm	19
Relation of type of farming to size of farm	7	Legumes	22
Investment	7	Tenure	24
Profitableness of the various types	8		

THE AREA IN WHICH THE SURVEY WAS MADE.

During the summer of 1915 an analysis was made of the business of 274 farms lying within a radius of about 5 miles of the town of Monett, in southwestern Missouri,[1] the center of the survey area lying in the line between Barry and Lawrence Counties. This locality is typical of a considerable area lying along the western margin of the Ozark area and the eastern margin of the western prairies. In general, the highest uplands were originally prairie and the slopes and bottom lands timbered.

The surface would be described, for the most part, as gently rolling. A small stream flows from east to west through the town of Monett. The bottom lands bordering it form a tract from a quarter to a half mile wide, flanked on each side by a moderate rise of land hardly prominent enough to be described as bluffs. Beyond is gently rolling upland originally covered, for the most part, with blackjack timber (a species of oak) and extending back to the prairie areas covering the ridges between streams.

[1] The farm analyses on which this bulletin is based were made by Messrs. Walter J. Tubbs, Ivan Allen, C. E. Allred, and F. D. Crum, under the direction of Mr. F. H. Branch. Mr. R. D. Jennings has rendered material assistance in tabulating the data and computing the tables. Acknowledgment is also due to the many farmers who kindly furnished details concerning their farm business, thus making this study possible.

18027°—18—Bull. 633——1

The soil of this region was formed mostly from limestone in which was imbedded a considerable amount of flint, sometimes in rather large masses. The limestone itself was dissolved out by rain water carrying small quantities of carbonic-acid gas in solution, leaving the impurities of the limestone (consisting mainly of small or large particles of flint) to constitute the resulting soil. On the slopes, where the finer particles of soil have been washed away, the land is rocky, the rocks consisting of angular fragments of flint, for the most part from 1 to 3 or 4 inches in diameter. Elsewhere, especially where the land was originally covered with blackjack timber, the soil is rather gravelly. The alluvial soil of the bottoms contains more or less gravel. On the higher ridges, which were originally prairie, the soil is somewhat finer in texture and less inclined to be gravelly. These prairie soils were formed in part from shales. On the whole, the soil may be described as gravelly loam or gravelly silt loam. Like most medium to heavy soils, it is fairly fertile, especially when abundantly supplied with decaying organic matter such as manure and the refuse from crops.

The first settlers who came into this region came mainly from wooded regions and took up land along the streams. Most of the stream bottoms have been in cultivation for about three-quarters of a century. About 40 or 45 years ago farmers began to come into the region from prairie districts, especially from Illinois. These settled on the prairies. The prairie lands have thus been in cultivation somewhat less than half a century.

The wooded slopes between the prairies and the bottom lands have been cleared and put into cultivation mainly during the last 30 years, the amount of woodland left being scarcely sufficient to supply local farm needs.

THE LOCAL AGRICULTURE.

Wheat is decidedly the most important of the local crops at the present time, corn being second in importance. The percentage of the crop area devoted to wheat for the crop year 1913–14 on the farms included in this survey was 48.8, or practically half of the entire area. Corn occupied 25.1 per cent. The position of these two crops, so far as acreage is concerned, has been practically reversed in the last 20 years. In 1890, according to the census for that year, corn occupied 46 per cent of the crop area in Barry County and 41 per cent in Lawrence County. In the same year wheat occupied 24 per cent of the crop area of Barry County and 33 per cent in Lawrence County.

The reason for this change in the status of wheat and corn in this locality is not known definitely. The present high price of wheat is not responsible for it, for the crop to which this survey relates was

sown in the fall of 1913, when the price of wheat was still moderate. It is probable that the frequent occurrence of hog cholera in this region may be partly responsible for the decrease in the acreage of corn and the increase in the acreage of wheat, as the number of hogs kept on these farms has decreased considerably in recent years.

The oat crop occupied 10.8 per cent of the crop area on these farms, which is about a normal acreage for this crop. A great many farmers here do not grow oats. In general, the crop is not satisfactory, it being too far north for winter oats and too far south for spring oats. Not infrequently the crop is an entire failure. The reason for the persistence of the oat crop under such unfavorable conditions is its value as feed for horses and the scarcity of other kinds of roughage. For the most part, the oats are cut and bound and fed in the sheaf. A portion of the crop may be thrashed and fed as grain.

Various hay crops occupy about 9 per cent of the crop area of the farms surveyed, which is approximately the status occupied by such crops for the last quarter of a century. About two-thirds of the hay land is in timothy or timothy and clover, the rest being in millet, sorghum, oats, rye, etc.

FRUITS.

The town of Monett is the center of one of the most important strawberry-producing regions in this country. The acreage of berries is not large when compared with that of wheat and corn, or even hay, but it is very considerable when the intensity of the strawberry enterprise is taken into consideration. Of the 244 farms[1] included in this bulletin, 1.5 per cent of the total crop area was in strawberries, two-thirds of which were in bearing. Other fruit crops also are more or less prominent. Apples occupy 2.6 per cent of the total crop area, and other fruits six-tenths of 1 per cent. While small areas of fruit are found on farms of all sizes, it is mainly the smaller farms that make fruit growing a specialty.

YIELDS PER ACRE.

The average yield of corn on these farms for the year 1914 was 25 bushels per acre, which is approximately normal. The yield of this crop in Barry County at the last three censuses was, respectively, 26, 25, and 17 bushels. In Lawrence County it was 26, 21, and 24 bushels.

The average yield of oats for the year of this survey was 24 bushels, as compared with census figures of 21, 22, and 23 for Barry County, and 22, 25, and 26 for Lawrence County. This again is a normal yield.

[1] Thirty farms operated by owners who rented out a part of their land are omitted in most of the discussion which follows.

The yield of wheat for the year of the survey was somewhat above the normal, being 16 bushels as compared with Barry County yields of 13, 10, and 12 bushels at the last three censuses and Lawrence County yields of 14, 12, and 14 bushels. This higher yield of wheat is believed to be due to a recent marked increase in the use of commercial fertilizers rather than to climatic conditions for the year.

The yield of hay was about half a ton per acre. This is a little less than half the normal yield according to the census figures. But the minor place occupied by hay crops in the agriculture of this locality renders this low yield of hay relatively unimportant.

The average yield of strawberries the year of the farm survey was 74 crates per acre, as compared with Barry County yields of 62 and 50 crates for the last two census years, and Lawrence County yields of 90 and 56 crates. Considering the marked variability in the yields of this crop, the yield for the year of the survey may be considered as practically normal.

FARMS CLASSIFIED ACCORDING TO TYPE OF FARMING.

The 244 farms included in this study may be divided into five groups according to type of farming carried on, though in most cases the line of division between the various types is more or less arbitrary. One hundred and sixteen of them may be classed as grain and live-stock farms. They consist of farms on which the principal income is from grain, in nearly all cases wheat, with more than 10 per cent of the total income from some one type of live stock, usually cattle or hogs.

On 66 of the farms grain (wheat in most cases, corn in a few others) constituted the only source of income exceeding 10 per cent of the total receipts. These are classed as grain farms. Forty-one are classed as grain and fruit farms. They include farms on which both grain and fruit are important sources of income, with no other income from any one source exceeding 10 per cent of the total.

Seventeen of the farms are classed as fruit farms. The average income from fruit on these farms is about 60 per cent of the total. About half of these fruit farms had 10 per cent or more of their income from cattle.

There were four farms which made the dairy business an important feature. On two of them dairying was the only important source of income; on the other two grain was about as important as dairying, but these four farms were grouped together because they were the only ones on which the dairy business was a principal feature of the farming. Because of the small number of dairy farms they are omitted from most of the tabulations for the reason that averages of only four items have little meaning.

SOURCES OF RECEIPTS.

Table 1 shows the sources from which these 244 farms obtained their income.

TABLE 1.—*Sources of receipts (244 farms near Monett, Mo.).*

[Figures represent percentage of total receipts.]

Source.	Grain and live stock farms (116).	Grain farms (66).	Grain and fruit farms (41).	Fruit farms (17).	Source.	Grain and live stock farms (116).	Grain farms (66).	Grain and fruit farms (41).	Fruit farms (17).
	Per ct.	*Per ct.*	*Per ct.*	*Per ct.*		*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
Corn	4.3	8.0	1.6	2.2	Horses	6.5	5.2	3.7	3.5
Oats	.8	1.0	.6	.3	Sheep	.1	.....	.....	.....
Wheat	48.2	60.7	34.9	1.7	Hogs	7.1	2.0	3.6	2.7
Small fruits	2.3	1.8	30.1	50.3	Poultry	5.0	4.9	4.5	4.2
Other fruits	1.3	.3	7.7	8.5	Other stock	.4	.2	.2	.1
Other crops	1.1	1.6	2.2	2.6	All stock	34.5	19.0	17.2	25.4
All crops	58.0	73.4	77.1	65.6	Miscellaneous	7.5	7.6	5.7	7.3
Cattle	15.4	6.7	5.4	11.9					

It will be seen that there is a considerable degree of diversity in the farming of this region. Wheat is decidedly the most important source of income on the grain and live-stock and on the grain farms, about equal to small fruits on the grain and fruit farms, while on the fruit farms there is no other important source of income from crops than small fruits, especially strawberries. Among the various classes of live stock, cattle lead as a source of income in all the groups. Poultry furnishes from 4 per cent to 5 per cent of income in each group. Hogs are unimportant, except on the grain and live-stock farms, where the income from them constitutes about 7 per cent of the total receipts.

PERCENTAGE AREA IN DIFFERENT CROPS.

Table 2 shows for the four principal types of farming the percentage of land devoted to various crops.

TABLE 2.—*Relation of type of farming to percentage area in different crops (244 farms near Monett, Mo.).*

[Figures represent percentage of land devoted to crops specified.]

Crop.	Grain and live stock farms.	Grain farms.	Grain and fruit farms.	Fruit farms.	Crop.	Grain and live stock farms.	Grain farms.	Grain and fruit farms.	Fruit farms.
	Per ct.	*Per ct.*	*Per ct.*	*Per ct.*		*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
Corn	26.9	26.0	19.6	33.9	Other forage	1.3	1.1	0.4	5.8
Wheat	48.5	53.1	50.2	9.0	Strawberries	.5	.4	5.1	9.3
Oats	11.3	11.3	8.8	7.4	Other small fruits	.1	.....	1.2	10.8
Hay	6.8	5.1	5.0	7.7	Apples	2.1	1.0	6.3	5.8
Millet	1.0	.4	.6	2.6	Other fruits	.3	.5	1.0	3.2
Sorghum	.7	.3	.6	2.9	Other crops	.5	.4	1.2	1.6

On the grain and live-stock farms and on the grain farms corn occupies about one-fourth of the total crop area, wheat about half, oats about 11 per cent, hay 5 to 7 per cent, with no other crop occupying as much as 2 per cent of the area except in the case of apples on the grain and live-stock farms. On the grain and fruit farms the area of corn is smaller, and that of wheat is about the same as in the two preceding groups, while strawberries rise to 5 per cent and apples to 6 per cent of the entire crop area. On the fruit farms corn occupies one-third of the total crop area, wheat oats, and hay are about equally important, occupying from 7 per cent to 9 per cent, strawberries occupy 9.3 per cent, and other small fruits 10.8 per cent, while apples are nearly as important is in the preceding group.

KINDS OF FRUIT AND THEIR LOCAL IMPORTANCE.

Of the 17 farms here classed as fruit farms, strawberries were produced on all but one, and on this one there was an acre of new planting of strawberries. On three of these farms the area of bearing strawberries was 1 acre; on four it was 1½ acres; on one it was 2 acres; on four 2½ acres; on one 3 acres; on one 4 acres; and on two 6 acres. The total sales of strawberries on 16 of these farms amounted to $8,251, an average of $516 per farm.

The next most important fruit is blackberries. They were grown on 12 of the 17 fruit farms. One of the farms with 6 acres of strawberries had also 12 acres of blackberries. The other farm having 6 acres of strawberries had 10 acres of blackberries. Two farms had a quarter of an acre of blackberries each, 5 farms had from 1 to 1½ acres, and the remaining 3 from 3½ to 5 acres. The 2 farms having large acreages of both strawberries and blackberries also had large acreages of raspberries, one 10 acres and the other 7. Three other farms had from 1 to 2½ acres of raspberries. There were 5 acres of dewberries on one farm and a quarter of an acre of grapes on each of 2 farms.

Of the tree fruits, nearly all fruit farms had apples; but only five derived any income from this source, the largest amount being $250. Seven farms also had small acreages of peaches, in only two cases more than 1½ acres, the area in these two cases being respectively 4½ and 6 acres. The sales of peaches on the two farms last mentioned were respectively $300 and 600; on the other three farms $15 to $75 per farm. Two farms had small incomes from cherries, one from plums, and one from pears, in no case exceeding $100. One farm had three-quarters of an acre in nursery stock, from which sales amounting to $170 were made. The total acreage of blackberries on these farms was 41 acres and the total acreage of strawberries 43; but more than half the blackberries were on two farms, so that strawberries may be considered by far the most general fruit crop of the region.

RELATION OF TYPE OF FARMING TO SIZE OF FARM.

In Table 3 the 244 farms are divided into groups based on area in crops. The table shows for each of these size-groups the percentage of farms that follow the different types of farming.

TABLE 3.—*Percentage of farms in each of six size-groups, devoted to type of farming specified (data from 244 farms in the vicinity of Monett, Mo.).*

Type.	Number.	Acres in crops.					
		39 or less.	40–79	80–119	120–159	160–199	200 or more.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Grain and live stock	116	19	43	59	66	60	67
Grain	66	19	34	24	23	20	33
Grain and fruit	41	24	20	12	8	20	.....
Fruit	17	38	2	2	.....	.....	.....
Dairy	4	.....	1	3	3	.....	.....
Number	244	37	103	58	35	5	6

It will be noticed that of the farms having less than 40 acres in crops 38 per cent are fruit farms and 24 per cent grain and fruit farms. In this group there are also 19 per cent of grain and live stock farms and 19 per cent of grain farms. These figures bring out the important fact that among the small farms fruit is a predominating enterprise. This is as it should be, for these farms are too small to give full employment in the production of corn and wheat, the staple crops of the region, and it is necessary, in order that their owners shall make an adequate living, that they introduce enterprises that give more work per acre than corn and wheat.

In the next size-group, consisting of farms having from 40 to 79 acres of crops, the largest percentage consists of grain and live-stock farms, with grain farms next, followed by grain and fruit farms. Only 2 per cent of these farms are fruit farms, while one of them is a dairy farm.

In the third size-group, containing farms with 80 to 119 acres of crops, more than half of them are grain and live-stock farms. This is true of each of the three remaining groups. In these last four groups there is still a considerable percentage of grain farms and a few grain and fruit farms. There is a single fruit farm in the third size-group. Two of the dairy farms are in this group, and one in the next higher group.

The last line of the table shows the number of farms in each size-group, while the first column shows the number of farms in each type-group.

INVESTMENT.

Table 4 shows the relation between size of farm and the total investment and the relation between type of farming and total investment. One of the fruit farms is omitted from this table and from

Table 5 for reasons that will be given later, but this makes only a slight change in the figures.

TABLE 4.—*Average total investment on farms of different size and type (243 farms near Monett, Mo.).*

Type.	Acres in crops.					
	65 or less.	66–95	96–125	126 and over.	All sizes.	Average.
						Acres.
Grain and live stock	$5,926	$9,335	$12,875	$17,386	$11,015	95
Grain	5,084	7,824	[1] 12,251	.....	7,395	76
Grain and fruit	5,190	[2] 10,114	.....	.....	7,594	68
Fruit [3]	.....	.....	.....	.....	4,919	36
All types	.....	.....	.....	.....	9,033	81

[1] 96 and over. [2] 66 and over. [3] Not including one exceptional farm

PROFITABLENESS OF THE VARIOUS TYPES.

Table 5 shows the relation between labor income and size of farm, and the relation between labor income and type of farming. It may be explained here that labor income is what the farmer gets for his labor and managing ability. It is found by deducting from the net income of the farm a fair rate of interest on the investment, which in this case was taken to be 5 per cent. In addition to labor income as obtained in this manner the farmer has what the farm furnishes toward the family living.

TABLE 5.—*Labor incomes on farms of different size and type (243 farms near Monett, Mo.).*

Type.	Acres in crops.				
	65 or less.	65–95	96–125	125 and over.	All sizes.
Grain and live stock farms	$117	$321	$617	$759	$438
Grain farms	41	313	414	.....	192
Grain and fruit farms	232	598	.....	.....	410
Fruit farms [1]	.....	.....	.....	.....	294
All types	.....	.....	.....	.....	370

[1] Not including one exceptional farm.

As previously stated, one of the fruit farms is omitted from this tabulation. It was a very exceptional farm. It had 6 acres of strawberries, from which the sales amounted to $1,468; 10 acres of blackberries, with sales of $1,650; 10 acres of raspberries, with sales of $900; 5 acres of dewberries, with sales of $175; 10 acres of apples, with sales of $180; and 6 acres of peaches, with sales of $600. There was also 1 acre of young cherry trees. This farm is thus seen to be a highly specialized fruit farm. That its owner was an expert fruit

grower is attested by the fact that his labor income amounted to about $2,500. That is, the net income of his farm was $2,500 more than 5 per cent on his investment.

The relation between labor income and the size of farm as indicated by the area in crops is brought out very strikingly in Table 5. Taking first the grain and live stock farms, those in the group having 65 acres or less in crops each made only $117 more than interest on their investment. As the area in crops increases the labor income increases, averaging $759 for the group having 125 or more acres in crops. The grain farms and the grain and fruit farms tell the same story.

In all the surveys that have been made by the Office of Farm Management the results have shown conclusively that men of average ability must farm rather large areas in order to secure a satisfactory income. It is only the exceptional man that can realize the ideal of the "little farm well tilled." The average man should not try to do so. Just how large a farm should be for best results it is difficult to say. A good deal depends upon the type of farming. A farm of an intensive type—that is, one which requires a great deal of labor and working capital for each acre in cultivation—may be smaller than one devoted to enterprises requiring less labor and working capital.

The two-man farm has many advantages as opposed to a one-man farm, for in a great many farm operations two men are needed. So far as profit of the owner is concerned, there appears to be no upper limit to the size of farms except the managerial ability of the operator; but when farms are larger than fair-sized two-man farms—that is, farms that will give two men constant employment throughout the year—certain important disadvantages to the community appear. In the first place, the community is filled up with a class of hired labor which is not an addition to the permanent citizenship; farm houses are farther apart; there are fewer children for the district school; and it is more difficult to secure good roads. The two-man farm may, for many reasons, be considered as approaching the ideal for American conditions.

There is room in every community for a few farms devoted to the production of vegetables and fruits, and these may well be small farms because of the intensive labor such farming involves. This is especially true when the markets for the products of such farms are local. But when the farmer must depend upon distant markets and is thus thrown into competition with other regions engaged in similar types of farming, the small, intensive farm is placed at a serious disadvantage. Only about 4 per cent of the total crop area of the entire country is devoted to fruits and vegetables, yet this area supplies approximately the entire demand for products of this class. A relatively slight increase in the production of fruits and vegetables re-

sults in flooding the market and thus lowering prices below the point of profit. Farming based wholly on vegetables and fruits to be sold in distant markets is thus decidedly a speculative business. In general it is an unsafe kind of farming, though in some years it may be highly profitable.

THE PROPER STATUS OF THE STRAWBERRY INDUSTRY IN SOUTHWEST MISSOURI.

A farm that is large enough to give full employment to the labor available to the owner in the production of wheat, corn, and live-stock products can be made profitable in this region without depending on fruit as a source of income. Yet even on these farms a small acreage of strawberries properly tended is a desirable enterprise. In some years the income from them will be small, but in other years it will be considerable. Even if the crop is an entire failure, the farmer is not crippled financially.

On farms that are too small to give full employment in the production of wheat, corn, and live-stock products there is greater need of some intensive crop like strawberries as a means of giving employment to farm labor; that is, of increasing the magnitude of the farm business. The force of this remark is shown by the experience of farmers in this community, for by far the greater portion of the strawberry area is on the smaller farms, as should be the case. However, Table 5, showing the average labor income from different types of farming, shows that the very small farms devoted mainly to fruit are not as satisfactory as larger farms on which grain and live stock are the main sources of income.

In this connection it may be noted that the average value of man labor per crop-acre on the grain and live-stock farms was $5.16, on the grain and fruit farms $7.45, while on the 17 fruit farms it was $14.92, or nearly three times as much as on the grain and live-stock farms.

The number of acres of crops per man on the four types of farms was as follows: Grain and live stock, 59.3; grain, 54.3; grain and fruit, 42.5; fruit, 22.3. This shows the greater intensity of fruit farming as compared with the other types prevailing in the region.

THE SPECULATIVE NATURE OF FRUIT ENTERPRISES.

Fruit crops of all kinds are occasionally a complete loss from untimely frost. This has been the case with the strawberry crop in the vicinity of Monett, Mo., once in the last 10 years.

In occasional years also prices are so low that no profit is made in the business. These are years when the crop is unusually good in

a number of the leading fruit-producing sections of the country. This region has experienced two such years in the last decade.

These occasional years which produce no profit and sometimes result in rather heavy loss make fruit growing a speculative business. In the long run the good crops or the high prices, or the occasional combination of a good crop with high prices, will bring in enough money to make the business profitable in localities that are well adapted to it, as this region undoubtedly is to the strawberry crop. But the uncertainty of a profit in any particular year renders it unwise for the farmer to depend entirely on income from such enterprises. On farms devoted largely to fruit growing this uncertainty may be obviated partially by having several kinds of fruit, for it is hardly likely that all of them will fail to produce a profit in any one year. The most successful fruit farm found in this survey was really a diversified fruit farm. It must be remembered, however, that it takes a man of very unusual ability to make a success with a business of this character. Where fruit is a minor enterprise, such diversification is not so necessary and may even be quite undesirable.

If there is a good local market which renders shipping to distant points unnecessary, there is considerable advantage in growing several kinds of fruit; but where shipping is necessary the saving from shipping in car lots is so great as to place the producer of small lots at a disadvantage. Diversification in fruit growing as a means of insurance against crop loss must therefore be undertaken only after careful consideration of the marketing problem.

Another factor which must be taken into consideration is the danger from disease and insect pests to which fruit crops of all kinds are exposed. Occasionally a disease gets a start among strawberries, appears in the nurseries, and is spread over a large region before its presence is suspected. This causes heavy loss, not only to the nurseryman, but to those who have bought plants from him.

With all these disadvantages, however, the facts indicate that the strawberry business is a good one for the farmers of this region. It seems to be clear also that in the vast majority of cases the proper place of this crop is represented by a few acres. The smaller the farm the larger the acreage of strawberries required to fill in the labor schedule. The fact that the largest acreage of strawberries on any one farm was 6 acres is significant. This is about what an ordinary farm family can take care of except at harvest time. On the larger farms 1 or 2 acres of strawberries would generally be desirable.

Nothing has been said here about the amount of labor required in harvesting the strawberry crop, since no particular local difficulty appears to arise in this connection. The work is made more or less a festival, and thousands of people from the surrounding towns come

into camp near the fields for the few weeks when there is a rush of work of this kind. The amount of labor required for harvesting the crop is therefore not really a limiting factor in the acreage that the farmer can grow. The limit is represented rather by the area which he and his family can tend at times other than harvest.

MAINTENANCE OF SOIL FERTILITY.

The systems of farming which prevail generally in this region are not such as to maintain satisfactorily the fertility of the soil. As a result the yields on most farms are low. The three more important factors in maintaining crop yields are the use of manure, the plowing under of sod crops or green manure crops, and the use of commercial fertilizers. On most of these farms the amount of live stock kept is small compared with that kept on farms farther north. The amount of manure produced on the farm is not sufficient to maintain the fertility of the soil at a satisfactory level. Furthermore, on account of the general mildness of the climate, farm animals are not kept indoors much of the time, and a good part of the manure thus is not available for distribution on the tilled fields. Farmers therefore get relatively little from the manure actually produced on the farm.

In order to determine the results actually obtained from manure the farms in this survey were divided into two equal groups, the first consisting of those farms having less live stock than the average per hundred acres of crops, and the second of those having more than the average. A comparison was then made between these two groups of farms with respect to the average yield of each of the more important crops. The difference in favor of the farms having the more live stock was as follows: Corn, 1½ bushels per acre; wheat, 0.6 bushel; oats, 2.5 bushels; hay, 0.1 ton.

When the relative acreage of these crops and the average price of their products for the last 10 years are taken into account this difference in yield in favor of the farms having more live stock than the average amounts to $5.14 per year for each animal found on the farms having most live stock over and above those found on farms having least live stock. In other words, under the average conditions which prevail in this locality the farmer, on the average, actually gets in crop returns $5.14 from the manure of each 1,000-pound animal or its equivalent in smaller animals. This is a very low valuation for manure, a fact which undoubtedly is due largely to the small proportion of the manure that is actually applied to the fields. By taking the best possible care of manure, by distributing this manure in the fall of the year on land that is to be devoted to corn the next year, and either disking it into the land or plowing

shallow before cold weather it is probable that these farmers would get practically double the result they now get from this manure.

In this connection it may be stated that in Chester County, Pa., where the live stock consists mainly of dairy cows which are kept in stables practically all winter and at nights during most of the summer and where the manure is managed with unusual care the value of manure per cow was found by the method above outlined to amount to between $15 and $16 a year.

Table 6 shows the average yield of corn and wheat on the two groups of farms designated as grain and live-stock farms and grain farms. This table shows that on the average the grain and live-stock farms obtained 3.7 bushels more corn per acre than did the straight grain farms. On the other hand, the grain farms obtained an average of 0.6 of a bushel more wheat per acre than the grain and live-stock farms. This difference is due to two causes. In the first place, manure is applied mainly to corn land on both groups of farms. The grain and live-stock farms, having more manure, get larger yields of corn. But wheat gets comparatively little benefit from the manure, dependence being placed on commercial fertilizers for this crop. Table 6 shows that the grain farmers used more fertilizer than the grain and live-stock farmers. Hence they get larger yields of wheat. The figures of this table show that, for those farms using commercial fertilizers, the grain farmers used $11 worth more per 100 acres of crops than did the grain and live-stock farmers.

TABLE 6.—*Yield of corn and wheat on grain and live stock and on grain farms (182 farms near Monett, Mo.).*

Type.	Corn.	Wheat.	Fertilizer bought per 100 acres of crops.	
			Farms reporting.	All farms.
	Bu.	*Bu.*		
Grain and live stock farms	26.8	16.1	$44.5	$33.0
Grain farms	23.1	16.7	55.5	40.3

Studies of methods of maintaining good yields have shown that the plowing under of sod crops is very important. Crops of this character are not much grown in this region, almost the only sod crop being a few acres of timothy, and usually this is left down for many years and pastured rather closely, so that even when it is plowed up not much effect results from the sod plowed under. In the absence of sod crops and of abundant manure the plowing under of crops especially sown for the purpose becomes important. But

this is a practice very little followed in this region. This phase of the problem of maintaining soil fertility will be referred to again in discussing the organization of farms in this area.

To show how important from the standpoint of profit good crop yields are, the data given in Table 7 will be of interest. In order to make the meaning of this table clear, it is necessary to tell what the crop index is. To say that the crop index of a particular farm is 90 means that the average yield of crops on this farm is 90 per cent of the average of the community. The farms included in this survey were divided into three groups, the first consisting of those on which the crop index was 90 or less, the second those having a crop index from 90 to 110, and the third those with a crop index of more than 110. There were 88 farms in the first group, 86 in the second, and 70 in the third. The average size of farm was nearly the same in each group. The average of the crop indexes of the first group was 76, the second 100, and the third 129. The average labor income of the first group was $122, of the second $377, and of the third $676. These figures show the outstanding importance of keeping the land fertile. It is one of the most important problems confronting farmers in this region.

TABLE 7.—*The effect of crop index on profits (244 farms near Monett, Mo.).*

Item.	Groups based on crop index.		
	90 and under.	90.1 to 110.	110.1 and over.
Number of farms	88	86	70
Average crop index	76	100	129
Average labor income	$122	$377	$676

ORGANIZATION OF SOME TYPICAL FARMS.

The organization of three typical grain and live-stock farms is shown in Table 8. Each of these farms has from 105½ to 107 acres in crops. It happens also in each case that the operator owns part of the land and rents additional land. The first one rents 62 acres, the second one 40, and the third one 38. These farmers have recognized the fact that it is easier to make a satisfactory income on a large farm than on a small one, and have chosen a very satisfactory means of enlarging their business in the absence of sufficient capital to own all the land they can till. It will be noted that they have almost exactly the same amount of live stock, the investment in this item being about $1,100 in each case. On one of them the value of the buildings, other than the dwelling, is very low. This is due to the fact that the buildings are very old and practically ready to be torn down.

TABLE 8.—*Three successful grain and live-stock farms (designated I, II, and III) operated by owners renting additional land (Monett, Mo., area).*

THE FARM.

Item.	I.	II.	III.
Area in crops.....acres	105½	106	107
Area in pasture.....do	34	15	37
Area rented.....do	62	40	38
Investment of operator.....dollars	9,493	7,568	10,493
Value of real estate per acre.....do	56	48	61
Value of live stock.....do	1,127	1,132	1,094
Value of implements and machinery.....do	215	305	168
Feed and supplies on hand.....do	111	101	191
Cash for current expenses.....do	40	30	40
Value of dwelling.....do	750	800	500
Value of other buildings.....do	75	400	500

CROPS.

Kind.	Acres.			Yield per acre.[1]			Sales.		
	I.	II.	III.	I.	II.	III.	I.	II.	III.
Corn	41	27	49	35	33	37	$340	$55	$589
Wheat	59	64	58	16	14	22	700	623	874
Oats	5	10	.....	15	27	.....	.....	.....	.....
Strawberries, new	.....	4	.....	.....	.....	.....	.....	.....	.....
Blackberries	½	.....	.....	36	.....	.....	22	.....	.....
Grapes	.....	¼	.....	.....	.....	.....	.....	.....	.....
Total crop sales	.....	.....	.....	.....	.....	.....	1,062	678	1,463

[1] Yields given are: For corn, wheat, and oats, bushels; for berries, crates; for grapes, baskets.

LIVE STOCK.

Kind.	Number.			Sales and increases in value.		
	I.	II.	III.	I.	II.	III.
Cows	5	4	5	$230	$260	$350
Young cattle	3½	2	6	85	70	10
Steers	1	.....	.....	8	.....	.....
Total income from cattle	.....	.....	.....	323	330	360
Including dairy products, amounting to	.....	.....	.....	230	260	225
Horses and mules	4	5	8	25	103	−20
Colts	.....	2	3	.....	100	120
Hogs	11	12	13	95	175	112
Poultry	65	65	100	66	59	96
Miscellaneous	.....	.....	.....	94	64	204

RECEIPTS, EXPENDITURES, AND PROFITS.

Item.	I.	II.	III.
Total receipts	$2,070	$1,835	$2,604
Rent	406	322	294
Other expenses	380	582	433
Net income	1,285	931	1,857
Interest on investment at 5 per cent	475	378	525
Labor income	810	553	1,332

TABLE 8.—*Three successful grain and live-stock farms (designated I, II, and III) operated by owners renting additional land (Monett, Mo., area).*—Con.

FACTORS AFFECTING PROFITS.

Item.	I.	II.	III.
Income per cow from sale of dairy products	$46	$65	$45
Feed bought	75	105	
Fertilizers bought	10		20
Value of family labor	30	6	54
Cost of labor hired	45	182	93
Months of labor on the farm	14.5	18.6	17.2
Average crop yields in percentage of community average	111	103	140

The second section of the table shows the crops grown on these farms—first, the acreage of each crop; second, the yield per acre; and third, the sales of crop products. Each farm has approximately 60 acres of wheat. The second farm has only 27 acres of corn, but the other two have between 40 and 50 acres. It will be seen later that the second farm is not as successful as the other two. Too much land is in wheat. This is shown by the yield of crops on these farms. On the second farm the yield of wheat is only 14 bushels, while on the third it is 22 bushels. Two of the farms have small acreages of oats, none of which is sold. The second farm has undertaken to increase its income by adding 4 acres of strawberries, which is probably wise in this case, though the acreage is a little large for the conditions. The first farm has a small patch of blackberries, from which there was an income of $22. The second farm has a small patch of grapes, but with no income from this source.

A study of the results given later in this table leads to the conclusion that the second farm is not so well organized and managed as the first and third. It has too much of its land in wheat, too little in corn, and too much in oats. The presence of grapes on the farm, a crop not well adapted to the region, confirms this conclusion. It will be noticed that the total income from the sale of crops on the second farm is only two-thirds to one-half as much as on the other two.

The next section of the table shows the live stock on these farms. Each farm has from four to five cows and from two to six head of young cattle. One of the farms reports a steer, which was a calf raised on the farm. The total income from cattle on each farm was from $323 to $360, of which $225 to $260 was from the sale of cream. These farmers were patrons of a creamery. The second farm raised two colts, and the third raised three. The third farm has too many horses for its size, but this defect is balanced by the raising of colts. The income from hogs varies from $95 to $175, and from poultry from $59 to $96. Both of these sources of income could be made more important with profit.

The total receipts on these farms, shown in the next section of the table, vary from about $1,800 on the second to $2,600 on the third.

The amount of rent they pay runs from about $300 to $400. Other expenses run from about $400 to $600. The high expenses on the second farm are due to the large amount of labor hired, which comes to $182. On the other two farms this figure is less than $100.

The net income, after deducting rent and other expenses, varies on these three farms from $931 to $1,857. This represents interest on the investment and wages for the labor and managing ability of the operator. Deducting interest on the investment, these three farms have labor incomes of from $500 to $1,300. These are considerably above the average for the region. Especially in the case of the first and third farms the labor incomes are very satisfactory.

The last section of the table shows a few of the factors which affect the general results obtained on these farms. The most important figures are those relating to the average yield of crops on these farms, given in the last line of the table. On the first farm the average yield of crops is 11 per cent above the average for the farms surveyed in the community, on the second 3 per cent above, while on the third farm it is 40 per cent above. It will be noticed that the labor income is approximately proportional to these figures expressing the average yield of crops on these farms.

Two of the farms obtained incomes from the sale of cream amounting to about $45 per cow. The other sold $65 worth of cream per cow. The amount of feed bought is small, the third farm, with its good yields, spending nothing for this purpose.

The total amount of labor on these three farms was equivalent to from 14.5 to 18.6 months of labor for one man. In other words, these farms are intermediate between one-man and two-man farms. Undoubtedly it would be profitable to convert each of them into full two-man farms by the addition of a little more live stock, a small acreage of forage crops, and a small acreage of strawberries.

The organization of the grain farms in this region differs from that of the grain and live stock farms mainly in the smaller amount of live stock kept, the greater acreage of land devoted to wheat, and the smaller acreage devoted to corn. On the grain and fruit farms the organization differs from that of the grain and live-stock farms by the introduction of a few acres of fruit, usually of strawberries, and by the smaller amount of live stock kept.

ORGANIZATION OF DAIRY FARMS.

As previously stated, four farms were found in this survey having considerable income from dairy products. The smallest number of cows on any of these four farms was 13 and the largest number 28. The income from the sale of dairy products on the four farms

was, respectively, $1,840 from 28 cows, $1,125 from 17 cows, $600 from 20 cows, and $624 from 13 cows. The farm having 28 cows raised 12 acres of corn and 10 acres of sorghum fodder; also 4 acres of millet and 3 acres of rye for hay. It had only 52.5 acres of crops, there being only 14 acres of wheat. The other three farms had from 100 to 135 acres of crops, including from 40 to 60 acres of wheat. One of these farms had 30 acres of corn, 15 of which was cut for silage. Because of the large number of cows on these farms it was necessary to supplement the corn by other kinds of forage. As already stated, one of the farms did this by growing 10 acres of sorghum fodder, 4 acres of millet, and 3 acres of rye hay. Another, which had 20 acres of corn, grew also 20 acres of sorghum fodder. The farm which had 15 acres of corn for grain and 15 acres of silage had 12 acres of clover for hay and 15 acres of rye pasture. The other farm had 40 acres of corn, 5 acres of cowpeas, and 25 acres of oats.

Two of these farms sold all their milk at retail in the town of Monett, the retail price being 4½ cents a quart. The income per cow for milk sold on these two farms was, in both cases, $67. A third farm obtained $200 for retail milk at 5 cents a quart and $400 from cream sold to the creamery at an average of 25 cents per pound for butter fat. The fourth farm sold only butter, the average price being 27½ cents, and the income from this source being $624. The labor incomes on these farms were $1,691, $552, $663, and $1,299, respectively.

A good dairy cow should produce 4,000 or 5,000 pounds of good milk a year. The average pounds of milk per cow on these four farms, not counting the milk consumed on the farm, was as follows: 3,188, 3,743, 2,030, and 2,268. On three of them the cows were all Jerseys, some of them pure bred and others grades. One of the farms had Jersey grade cows with a Hereford bull. It also had four pure-bred Hereford cows and was probably changing from the dairy business to the beef-cattle business. It would be a great mistake for a dairyman to use a bull of a beef breed if he wishes to continue in the dairy business.

Judging by the experience of the majority of farmers here the proper status of dairying in this region, except for the few farms that are needed to supply milk to the town, is represented by the keeping of a few cows mainly as a means of converting roughage and other unsalable materials into a salable product, the cream being sold to creameries and the young stock being raised mainly on waste products of the farm. These cows should be either good dairy cows or good animals of a beef breed, the principal income from them in the latter case being from the sale of young stock.

A WELL-ORGANIZED TWO-MAN FARM.

These studies indicate that a satisfactory business can be conducted on a well-organized farm in this region. The most important difficulty confronting the farmers here appears to lie in the fact that the system of farming which seems to be best adapted to local economic conditions does not provide satisfactory means of keeping up the fertility of the soil. The most important factors in maintaining fertility are sod crops, manure, and fertilizers. The area of sod crops grown on these farms or needed in the local farm economy is very small and has very little influence on the fertility of the soil. Particularly is this the case when the sod, which usually is timothy, is kept for several years and pastured rather closely before being plowed up.

The amount of live stock kept on these farms is not only small, but such animals as are maintained are kept out of doors a very large part of the time and a great deal of the manure is lost, so far as the field crops are concerned.

Aside from the loss of manure from unconfined live stock, the principal wastage on these farms is in corn fodder and wheat straw. There is every reason to believe that if cowpeas were planted with all the corn at the time the corn is planted, using two cowpea seed for every grain or corn, and then cutting the corn for fodder, it would pay these farmers to keep enough live stock to consume these corn stalks with the cowpea vines on them. If the stock kept for this purpose are dairy cows it will be necessary, of course, to buy considerable quantities of mill products to feed with the roughage. Whether this will pay will depend on the dairy quality of the cows kept. Conditions are not highly favorable to the dairy industry here. They are rather favorable to the raising of beef cattle. A considerable herd of cows of a beef breed could be maintained on these farms largely on roughage in winter and pasture in summer, and as this roughage is now available it would seem that this business ought to add considerably to the farm income in this region. Particularly would this be true if the cows were such as to produce $45 to $60 worth of dairy products per year in addition to a good calf.

In this connection it may be mentioned that in recent years quite a number of farmers in this general region have stocked their farms with pure-bred beef cattle, and the results are proving to be very satisfactory. This is a type of cattle farming that does not require a great deal of labor and that provides an outlet for the wastes which now occur on these farms. At the same time it does not require the purchase of large quantities of mill stuffs, for these animals can be maintained very well on cornstalks and cowpea fodder of good quality, a little straw, and a little corn, with perhaps an

occasional feed of bran or shorts. If good pastures are provided for the summer season, the expense of keeping a mature herd of this kind will be rather small.

These studies indicate that a well-organized two-man farm in this region might be based upon the following crops: Corn and cowpeas, 40 acres; wheat, 60 acres; miscellaneous forage crops, such as soy beans, sorghum, oats, alfalfa, each in small acreages, say 2 to 4 acres; half an acre of garden; 1½ acres of apple orchard, mainly for home use. There might also be 3 acres of strawberries, 2 in bearing. This would give 117 acres of crops.

Two men, with four good horses, and with all the heavy work done with four-horse implements, could tend all these crops easily and do all the work, except at harvest time, without additional help; and they would have time to spare.

A good complement of live stock for such a farm would be two mules and four high-grade brood mares, these four mares doing the full work of two horses, and when bred to a sound pure-bred stallion or the same type or breed should raise two colts each year. These two colts, when sold at a year old, should bring at least $100. Since the two mares not at work could be maintained rather cheaply and could help to consume some of the wastage on the farm, it is believed that this $100 income from colts would more than justify the keeping of the two additional mares.

Five cows, either of a dairy breed or of a beef breed, with five young cattle constantly on hand, would, with the help of the horses, consume the larger part of the waste of the farm, together with the small areas of miscellaneous forage crops mentioned above.

Two good brood sows, each raising two litters a year, amounting to at least 20 pigs during the year, would be about the right complement of swine, though if proper means were taken to guard against cholera, and if the relative price of corn and hogs should justify it, the number of brood sows kept might be larger than this. Assuming that five hogs will be needed for home use, this would permit a sale of fifteen 200-pound hogs a year.

Such a farm could maintain 150 hens easily, with very little cost. These hens, if handled with a little intelligent care, should easily bring in a dollar apiece annually, in addition to poultry products used on the farm.

Such a complement of live stock as outlined would consume most of the corn, all the corn and cowpea fodder, the miscellaneous forage crops, and a portion of the straw. The remainder of the straw should be used very liberally for bedding for the live stock.

An organization such as this could be established on a farm of 160 acres, provided there is not over 10 acres of waste land, which, in the nature of the case, must be devoted to the growing of timber. This would permit, in addition to the 117 acres of crops, 26 acres

of permanent pasture, 5 acres for roads and fences, 2 acres for yards and lots, and 10 acres for woods. If much of the farm is rough land, the area would have to be proportionately larger.

Such a farm would be particularly advantageous for a farmer with one or two growing boys large enough to take part in the farm work; also for the farmer who is growing old and is no longer able to make a full hand at the heavy work on the farm. With one dependable hand hired by the year and the use of four-horse implements as far as practicable, the hired man could do nearly all the field work of such a farm, leaving the owner to look after the live stock, the strawberries, garden, and orchard, and to keep in repair the buildings, fences, implements, etc. The farm family could tend the poultry.

Such a farm would have the equivalent of about eighteen 1,000-pound animals. These animals would produce approximately 180 tons of manure in a year. The bulk and value of this manure could be increased greatly by the liberal use of straw as bedding. By proper management 100 tons of mixed manure and straw could be distributed on the fields every year. This would give an average of $2\frac{1}{2}$ tons for every acre of corn on the farm. Such use of the manure should have a very important influence in keeping up the fertility of the soil.

The wheat straw produced on this farm should be returned to the land in some way. As much of it as possible should be used as bedding for the farm animals, and in this way be put into the manure. This gives a chance to rot the straw before it is put back on the land, a very important matter, since partially rotted straw is much better for the land than fresh straw. Such of it as can not be used in this way may be scattered directly on the fields. A very thin coating of straw can be spread upon wheat during the winter. A better plan is to scatter straw in the fall of the year on land that is to be devoted to corn the next year and then disk it into the soil before winter sets in.

Each field will be in wheat three times in succession, the first time following corn. After the third crop of wheat has been harvested from the field it would be a good plan to sow some crop immediately. It would not be necessary to plow for this crop, but it would be advisable to run a disk harrow over the land. The crop might consist of corn or sorghum sown thickly, or it might be cowpeas or soy beans. At some convenient time in the late summer or early winter this crop should be plowed under. It might be pastured for a while before plowing. By using all these means of adding humus-making material to the soil, and then by the use of such fertilizers for wheat as local experience has proved to be most profitable, the yields of corn and wheat might easily be raised considerably above the average for the region.

LEGUMES.

From the standpoint of the farmer the most important characteristic of the legume crops, like clover, alfalfa, cowpeas, soy beans, etc., is the fact that each of them has the power of supporting in their roots a kind of bacteria that gets nitrogen out of the air, and thus crops of this kind enrich the soil in nitrogen—one of the most important elements of soil fertility.

Clover has been grown more or less in southwestern Missouri since the country was settled. In some localities it is well established and holds a place in the cropping system. But, generally speaking, the experience of the farmers of this section with the clover crop has not been satisfactory. In those regions where clover is grown regularly the common practice is to sow it in the spring on winter wheat or with some spring grain crop. This method has been tried many times by the farmers of this region, sometimes with complete success but more often with more or less complete failure. The trouble is that in many years the moisture is not sufficient for both the grain crop and the young clover crop, and the clover dies either before the grain crop is harvested or immediately thereafter.

A few farmers of this general region have been successful with clover by sowing it alone in the spring on well-prepared land. It makes a small crop the first year and a good crop the second year: but this takes two years' use of the land in order to get a crop of clover, which is not satisfactory to most farmers. If the farmer could depend upon securing a good stand of clover by sowing it in the spring on winter wheat, the clover crop undoubtedly would be standard in this section; but since this method is not dependable, clover is of very small importance here.

Most of these farmers have tried alfalfa. Generally speaking, the crop has failed, though a few farmers in these two counties have grown it with greater or less success. It can not be recommended generally as a field crop here, though it is probable that with a little special attention a few acres of it might be grown to advantage on almost any farm. In this region it should be sown only on the richest land, and the land should be thoroughly limed and thoroughly inoculated either with dirt from an alfalfa field or from a sweet clover patch or with pure cultures of the alfalfa bacteria. If then the land is well prepared and harrowed frequently enough to kill the weed seeds in the surface, and the alfalfa sown at a time when the land has proper moisture in it late in the summer or in very early fall, the chance for a good stand of alfalfa is fair.

The only legume which is grown from time to time with success by practically all these farmers is the cowpea. All the land in this region appears to be inoculated for this crop; that is, it contains the

particular kind of bacteria that the cowpea crop requires in order to thrive. A few farmers grow a considerable acreage of cowpeas for hay. Relatively few plant cowpeas in their cornfields. But in view of the fact that the system of farming which prevails in this region is one which does not maintain soil fertility, it is advisable for farmers generally to give more attention to the cowpea crop. It has already been suggested that it is a good plan to plant the cowpeas with the corn at the time the corn is planted. When this is done the roots of the cowpeas will leave considerable nitrogen in the soil, and the cowpea vines, which will be harvested with the corn fodder, will ultimately be converted into manure and returned to the soil. In case the corn is not to be cut for fodder, it is just as well to plant the cowpeas in the corn at the time of the last cultivation of the corn and then plow the vines under either early in the winter or the next spring. This, of course, is not practicable where wheat is to follow corn, but it can be done where corn or any other spring crop follows corn.

The soy-bean crop deserves more attention than it has received from farmers in this region. It has been tried frequently here, but not always with satisfactory results, for the reason that some farmers do not understand its requirements. Cowpeas have been grown in America for 150 years, and the soil all over the eastern half of the United States appears to be thoroughly inoculated for this crop. Soy beans, on the other hand, were brought to this country rather recently from Japan and Manchuria. They will not thrive unless the soil has the proper kind of bacteria in it, and these bacteria are not yet generally spread over the country. Hence, in order to grow soy beans successfully the soil must be inoculated for them.

There are several methods of inoculating the soil for soy beans. Soy-bean seed carry some of the inoculating material, but very little. If a small patch be planted to soy beans for two or three years in succession it will become well inoculated, and the soil from this patch may then be used for inoculating any other part of the farm where soy beans are to be planted. Another method is to moisten the soy-bean seed with water in which a little glue has been dissolved, sprinkle a little dirt from a soy-bean field over the seed, let it dry, and then plant the seed. Great care must be used in this method not to let the sun shine on the seed, for sunlight kills these bacteria very quickly. Another method is to use the pure cultures of the soy-bean bacteria such as those furnished by the United States Department of Agriculture.

Soy beans have several very distinct advantages over cowpeas. The most important is that they ordinarily yield from half as much again to twice as much seed per acre as do cowpeas. They can be made into hay more easily than cowpeas, and this hay, if fed with a

proper mixture of coarser material, such as corn fodder, is just as good as cowpea hay. Another very important point is that soy beans can be used for hog pasture at any time, for hogs will eat the leaves on soy beans greedily, while cowpeas are good hog pasture only when the seed is ripe. Soy beans are also excellent human food.

The subject of legumes is discussed here somewhat in detail because of the great need for means of building up soil fertility in this region. In view of the fact that clover is not satisfactory, it is believed that it would be very distinctly advantageous for these farmers to sow cowpeas or soy beans, or at least some crop that will make a growth that can be turned under after wheat that is to be followed by corn.

TENURE.

One hundred and thirty-two of the farms studied in this survey were operated by their owners; 88 were operated by owners renting additional land; 24 were operated by tenants. Of 30 of the larger farms, part was rented out, the owner having more land than he could operate satisfactorily. Of the 88 owners renting additional land, 53 were in the group of grain and live-stock farmers and 18 in the group of grain farmers. Exactly half of the tenants were on grain farms, 9 on grain and live-stock farms, 2 on grain and fruit farms, and 1 on a fruit farm. Less than 10 per cent of the farms in this region are operated by tenants. This is much lower than the general average of tenant farming in the Middle West, or for that matter in any large area in the country. This is due partly to the average small incomes made on farms in the region. A tenant farm ordinarily must contribute to the living of two families. Hence tenant farming is not common outside of the plantation system in the South except where the farms are fairly large and productive.

Table 10 gives some interesting facts about land tenure in this region.

TABLE 10.—*Relation of tenure to profits (132 farms near Monett, Mo.).*

Item.	Owners.	Owners, renting additional.	Owners, part rented out.	Tenant.	Landlord.
Number of farms	132	88	30	24	24
Crop area.....acres	76.5	87.8	89.2	83.4	83.4
Capital.....dollars	9,130	6,519	10,370	1,061	7,144
Farm income.....do	765	748	603	477	232
Percentage on investment [1].....per cent	5.2	5.8	3.5	18.7	3.2

[1] After deducting operator's labor from farm income.

Tenant farms, on the average, have a larger crop acreage than owner farms. Tenants, with a capital only one-ninth that of the owners, obtained an income more than half as large. By deducting

from the farm income the value of the farmer's labor and converting the remainder into percentage of the investment of the operator, the results shown in the last line of this table are obtained. The average income on the investment of owners is 5.2 per cent. Farmers who own some land and rent other land have only about two-thirds as much capital as those who own all their land, but they make 5.8 per cent interest on their capital. Those farmers who have more land than they can till properly and rent part of it out make only 3½ per cent on their investment. The tenant, whose capital is all invested in live stock, implements and machinery, and other working capital, makes, in addition to his wages, 18.7 per cent interest on his investment. The owners of the tenant farms make 3.2 per cent net income after deducting their expenses.

The facts in this table are of interest to the young man who is just starting out with a very small amount of capital. They indicate that his wisest course is to farm a few years as a tenant, for by so doing he can make more money than if he invested his small capital in land.

TABLE 11.—*Relation of a given amount of capital to farm income of owners and tenants (220 farms near Monett, Mo.).*

Capital group.	Owners.			Tenants.		
	Number.	Farm area.	Farm income.	Number.	Farm area.	Farm income.
$500 and less				3	52	$337
$501–$1,000				10	99	363
$1,001–$2,000				9	122	436
$2,001–$4,000	23	54	$337	2	317	1,442
$4,001–$6,000	50	72	441			
$6,001–$8,000	32	94	613			
$8,001–$10,000	38	131	982			
$10,001–$15,000	54	156	1,135			
Over $15,000	23	250	1,545			
All farms	220	123	834	24	120	447

This fact is brought out still more strikingly in Table 11. Considering only owners and tenants, three farmers are found with $500 or less invested. These are all tenants farming an average area of 52 acres and making a net income of $337. In the next group are 10 farmers having a capital of $500 to $1,000, operating farms averaging 99 acres in area and making incomes of $363. These are all tenant farmers. In the next group 9 farmers, with capital of from one to two thousand, are operating farms of 122 acres and obtaining a net income of $436. It is significant that these also are tenant farmers.

In the next group, with $2,000 to $4,000 capital, are 25 farmers. All but two of them have bought small farms. Those who have bought farms are making incomes averaging $337. The two who

have remained tenants are making incomes averaging $1,442. Beyond this point the desire for economic independence and other advantages that accrue from the ownership of land becomes so strong that every farmer is an owner. It will be noticed that among the farms included in this study just as soon as the average income rises to a point which represents a satisfactory standard of living from owner operation tenantry ceases.

Another factor is involved here. The two farmers in the fourth group who remained tenants are operating farms averaging 317 acres in size. These farms are almost too large for the managerial ability of the average man. Hence the man on these farms who has more than $4,000 worth of capital finds it difficult to utilize all his capital as a tenant and very naturally invests it in land. The lesson is clear, however, for the young man with a small capital. For a few years at least it will be distinctly to his financial advantage to rent a good farm as large as his capital will permit. When he has saved enough to make a first payment on a farm large enough to permit a good standard of living, he then may well contemplate becoming an owner, and it is desirable from the standpoint of the public welfare that he do so.

PUBLICATIONS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE RELATING TO THE SUBJECT OF THIS BULLETIN

AVAILABLE FOR FREE DISTRIBUTION.

Corn Cultivation. (Farmers' Bulletin 414.)
Oats: Growing the Crop. (Farmers' Bulletin 424.)
Barley: Growing the Crop. (Farmers' Bulletin 443.)
Good Seed Potatoes and How to Produce Them. (Farmers' Bulletin 533.)
System of Farm Cost Accounting. (Farmers' Bulletin 572.)
A Corn-Belt Farming System Which Saves Harvest Labor by Hogging Down Crops. (Farmers' Bulletin 614.)
School Lessons on Corn. (Farmers' Bulletin 617.)
Growing Hard Spring Wheat. (Farmers' Bulletin 678.)
Management of Sandy Land Farms in Northern Indiana and Southern Michigan. (Farmers' Bulletin 716.)
Economic Study of Farm Tractor in Corn Belt. (Farmers' Bulletin 719.)
Corn Culture in Southeastern States. (Farmers' Bulletin 729.)
The Farmers' Income. (Farmers' Bulletin 746.)
Increasing the Potato Crop by Spraying. (Farmers' Bulletin 868.)
An Example of Successful Farm Management in Southern New York. (Department Bulletin 32.)
Farm-Management Survey of Three Representative Areas in Indiana, Illinois, and Iowa. (Department Bulletin 41.)
Farm Management Practice of Chester County, Pennsylvania. (Department Bulletin 341.)
Farming on Cut-Over Lands of Michigan, Wisconsin, and Minnesota. (Department Bulletin 425.)
Farming in Blue Grass Region, Study of Organization and Management of 178 Farms in Central Kentucky. (Department Bulletin 482.)
What is Farm Management. (Bureau of Plant Industry Bulletin 259.)
Some Outstanding Factors in Profitable Farming. (Separate 661. From Yearbook, 1915.)

FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C.

A Successful Hog and Seed-Corn Farm. (Farmers' Bulletin 272.) Price 5 cents.
Farm Practice in Columbia Basin Uplands. (Farmers' Bulletin 294.) Price 5 cents.
A Successful Alabama Diversification Farm. (Farmers' Bulletin 310.) Price 5 cents.
A Profitable Cotton Farm. (Farmers' Bulletin 364.) Price 5 cents.
Replanning a Farm for Profit. (Farmers' Bulletin 370.) Price 5 cents.
A More Profitable Corn-Planting Method. (Farmers' Bulletin 400.) Price 5 cents.
Soil Conservation. (Farmers' Bulletin 406.) Price 5 cents.
How a City Family Managed a Farm. (Farmers' Bulletin 432.) Price 5 cents.
A System of Farming in Central New Jersey. (Farmers' Bulletin 472.) Price 5 cents.

Lessons for American Potato Growers From German Exepriences. (Department Bulletin 47.) Price 5 cents.

Diversified Agriculture and Relation of Banker to Farmer. (Department Circular 50.) Price 5 cents.

Influence of Relative Area in Intertilled and Other Classes of Crops on Crop Yield. (Department Circular 57.) Price 5 cents.

Factors of Efficiency in Farming. (Separate 617. From Year Book 1913.) Price 5 cents.

Movement from City and Town to Farms. (Separate 641. From Year Book 1914.) Price 5 cents.

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
5 CENTS PER COPY